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10/823,502

04/12/2004

Chunlin Tao

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MORGAN, LEWIS & BOCKIUS, LLP (SF)  
ONE MARKET SPEAR STREET TOWER  
SAN FRANCISCO, CA 94105

EXAMINER

GROSS, CHRISTOPHER M

ART UNIT

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1639

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/823,502	<b>Applicant(s)</b> TAO ET AL.	
	<b>Examiner</b> CHRISTOPHER M. GROSS	<b>Art Unit</b> 1639	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 11-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Responsive to communications entered 6/16/2009. Claims 1-7,11-30 are pending.  
Claims 1-7,11-30 are under consideration.

#### ***Priority***

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the prior application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Prods., Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994) [taken from MPEP 201.01]

The present application was filed 4/12/2004 and claims priority as a DIV of application 09/847,113 filed 05/01/2001 (now PAT 6,753,143) which claims benefit of provisional application 60/201,026 filed 05/01/2000 and is a CIP of application 09/626,096 filed 07/26/2000. Nevertheless, claim 1 drawn to MFS comprising the formula  $-(CH_2)_n-(OCH_2CH_2)_m$  wherein when  $m=0$ ,  $n$  is not 18 and the Markush group genus set forth in new claim 28, Q-MFS-A-A-AG, (e.g. when A is not sulfur) are not disclosed in the earlier applications. With regard to the former, according to MPEP

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2173.05(i), any negative limitation or exclusionary proviso must have basis in the original disclosure. See also 35 USC 112 first paragraph rejection below.

Therefore 4/12/2004 is the date for the purposes of prior art concerning claims 1-7,11-30.

***Withdrawn Objection(s) and/or Rejection(s)***

The rejection of claims 1,5,6,7,8,11-14 under 35 U.S.C. 102(b) as being anticipated by **Offord et al** (1994 Langmuir 19:761-766) is hereby withdrawn in view of applicant's amendments.

The rejection of claims 1-14 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is hereby withdrawn in view of applicant's persuasive arguments.

***Maintained Claim Rejection(s) - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-14 plus 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Offord et al** (1994 Langmuir 19:761-766) in view of **Marks et al** (US Patent 6,203,758 – PTO 892 3/9/2007).

**Offord et al** teach throughout the document and especially the abstract the self-assembly of mixed dialkyl disulfides monolayers adsorbed on gold substrates.

In figure 1, compound 8 is a homolog of the material set forth in claims 1,5,6,8 when MFS is C-18, attachment linker (A) is sulfur and AG is tert-butyl. Said C-18 of compound 8 according to Offord et al does not conduct electricity, thus is taken as an insulator, as set forth in claim 7. Bearing four carbons, said tert-butyl group being AG reads on claims 11 and 12 when R3-R5 are each an alkyl group, claim 13 when n is 0 and is directly attached as set forth in claims 14, 15, 16.

Offord et al do not teach: contacting a metallic surface with a nucleic acid or protein capture binding ligand, as set forth in claims 2-4; a substituted or heteroalkyl containing MFS insulator, as set forth in claims 9-10.

**Marks et al** teach, throughout the document and especially the abstract and figure 4, methods employing device bearing a plurality of gold microelectrodes for detecting multiple molecular interactions in a microarray format.

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Marks et al teach in figure 5A, an oligonucleotide probe (capture binding species) bearing a monolayer forming species (MFS) with a terminal sulfhydryl group (A) for depositing on said microelectrodes, as set forth in claims 2 and 3. Said MFS of Marks et al is heteroalkyl substituted, as set forth in claim 9 and 10.

Marks et al teach in column 4, line 46 alternative embodiments for said capture binding entities including proteins, as set forth in claim 4.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made, to study the mixed dialkyl disulfides monolayers on gold substrates per Offord et al in with the microelectrode array device according Marks et al.

One of ordinary skill in the art would have been motivated to examine the mixed dialkyl disulfides minelayers on gold substrates using per Offord et al with the microelectrode array device according to Marks et al because the microarray is rapid and sensitive, as noted by Marks et al in column 3, line 25 and moreover, being able to perform multiple measurements simultaneously, in an array format, would provide more data in less time.

One of ordinary skill in the art would have had a reasonable expectation of success in combining the mixed dialkyl disulfides monolayers deposited on gold substrates per Offord et al with the microelectrode array device of Marks et al because both references concern derivatization of gold surfaces with thiol and disulfide groups, thus the method of Offord et al lies well within the scope of technology according to Marks et al.

\*\*\*

Please note that the above rejection has been modified from the original version to more clearly address applicants' newly amended and/or added claims and/or arguments.

*Response to Arguments*

In the paragraph bridging pp 8-9 of the response entered 6/16/2009, applicant argues not all elements are taught with regard to amended claim 1 drawn to MFS being comprising the formula comprising the formula  $-(CH_2)_n-(OCH_2CH_2)_m$  wherein when  $m=0$ ,  $n$  is not 18,

It is noted however, according to MPEP 2144.09: compounds which are homologs (*compounds differing regularly by the successive addition of the same chemical group, e.g., by -CH<sub>2</sub>- groups*) are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. In re Wilder, 563 F.2d 457, 195 USPQ 426 (CCPA 1977).

Absent evidence to the contrary, the octadecyl derivative of Offord et al would have similar properties to the undecyl compounds set forth in the rejected claims and thus constitute an obvious homolog.

***New Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7,11-30 rejected under 35 U.S.C. 102(b) as being anticipated by **Tao et al** (US Patent Application 2002/0121314).

*This rejection is necessitated by Applicant's amendment to the claims.*

Claim 1 is drawn to a method of modifying a metallic surface comprising:

contacting the metallic surface with an asymmetric monolayer forming species having the formula:

MFS-A-A-AG

A is an attachment linker moiety;

MFS is a first monolayer forming species comprising the formula

$-(CH_2)_n-(OCH_2CH_2)_m$ , wherein m is an integer from 0 to 10, n is an integer from 7-20, and wherein when m=0, n is not 18; and

AG is an electroconduit forming species.

Claims 2--7,11-30 constitute variations thereof

**Tao et al** teach, throughout the document and especially figure 17, modifying a metallic surfaces with CT105 (elected species) which reads on claims 1,5,7,11,13-30 when MFS is  $-(CH_2)_n-(OCH_2CH_2)_m$  (an insulator); n=11; m=3, AG is  $-CH_2(CH_3)_2-CH_2OH$ ; A=Sulfur.

In paragraphs 0008 and 0155, Tao et al teach various capture binding ligands including nucleic acids and proteins reading on claims 2,3 and 4.

In paragraph 0038, Tao et al teach gold surfaces, reading on claim 6.

Said CT105 reads on claim 12 when R3=R5=alkyl and R4=alkoxy.



***New Claim Rejection(s) – 35 USC § 112***

The following is a quotation of the **first** paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7,11-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection concerns “new matter.”

*This rejection is necessitated by Applicant’s amendment to the claims.*

Claim 1 has been amended to add the limitation wherein when  $m=0$ ,  $n$  is not 18. According to MPEP 2173.05(i), any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Amended claims 11 and 12 introduce new genera by now being depending upon claims 2,3,4,5,6 or 7 as well as claim 1 as previously presented. New claims 17-30 also introduce new genera.

The specification as originally filed provided no implicit or explicit support for any of the above limitations. See also discussion below.

Applicants are reminded that it is their burden to show where the specification supports any amendments to the disclosure. See MPEP 714.02, paragraph 5, last sentence and also MPEP 2163.06 I.

MPEP 2163.06 notes “If new matter is added to the claims, the examiner should reject the claims under 35 U.S.C. 112, first paragraph - written description requirement. *In re Rasmussen*, 650 F.2d 1212, 211 USPQ 323 (CCPA 1981).” MPEP 2163.02 teaches that “Whenever the issue arises, the fundamental factual inquiry is whether a claim defines an invention that is clearly conveyed to those skilled in the art at the time the application was filed...If a claim is amended to include subject matter, limitations, or terminology not present in the application as filed, involving a departure from, addition to, or deletion from the disclosure of the application as filed, the examiner should conclude that the claimed subject matter is not described in that application. MPEP 2163.06 further notes “When an amendment is filed in reply to an objection or rejection based on 35 U.S.C. 112, first paragraph, a study of the entire application is often necessary to determine whether or not “new matter” is involved. *Applicant should therefore specifically point out the support for any amendments made to the disclosure.*

#### Discussion

In the first paragraph on p7 of the remarks entered 6/16/2009, applicant attempts to point to support for the offending amendments by pointing to Figure 3E, Figure 9, Figure 17, and paragraphs [0011], [0023], [0030], [0066], [0071] to [0078], [126] and at least in structures 44, 45 and 46 of the present published application.

In this vein the following is noted. None of the cited passages provide support for when  $m=0$ ,  $n$  is not 18 as set forth in amended claim 1.

In none of figure 3E and the legend thereof in paragraph 0011; figure 9 the legend thereof in paragraph 0023; figure 17 the legend thereof in paragraph 0030; paragraph 0066, 0071-0078 (including structures 44-46); and paragraph 126 are the new genera set forth in claims 11, 12 or 17-30. For instance, each of the offending claims are drawn to *any* attachment moiety "A," while the cited passages each are drawn to sulfur (S) only. Furthermore new claim 28 introduces Q as a polyethylene glycol that may read on polymers with as many as 5000 repeating units, rather than the smaller oligoethylene glycols of paragraph 0066. Accordingly, the 6/16/2009 amendments introduce new matter without basis in the original disclosure.

The following is a quotation of the **second** paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7,11-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

*This rejection is necessitated by Applicant's amendment to the claims.*

Claims 1, 12,13, 15,24 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships concern 'n', which as

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set forth in claim 1 is drawn to the "spacer" group between the attachment linker moiety and the monolayer forming species (MFS) whereas in claims 12,13 and 15 (which ultimately depend from independent claim 1) it appears to be the spacer group between the attachment linker moiety and the electroconduit (AG).

Claims 17 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships concern where the attachment point is for the electroconduit shown. Exacerbating the problem, it appears the claims bear divalent hydrogen and/or monovalent oxygen. Appropriate correction is required.

Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships concern "n," as no range or upper limit is given, rendering the claim indefinite.

In accordance with MPEP 2173.02: If the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph, would be appropriate. See *Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed. Cir. 1993). .

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As currently written, the metes and bounds of the claims are unascertainable. Therefore, claims 1 and 28 as well as all dependent claims are rejected under 35 USC 112, second paragraph.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER M. GROSS whose telephone number is (571)272-4446. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571 272 0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher M Gross  
Examiner  
Art Unit 1639

cg

/ Christopher S. F. Low /  
Supervisory Patent Examiner, Art Unit 1639